

ART. IV.—*Cases of Penetrating Wounds of the Chest and Throat, illustrating some important Practical Points.* By JOHN ASHHURST, Jr., M. D., Resident Surgeon to Pennsylvania Hospital.

THERE is perhaps no class of wounds more deceptive in their results than those of the chest. A frightful gash, with the air blowing in and out at every respiration, will sometimes heal in a few days, and without a single bad symptom; while, on the other hand, a small, hardly perceptible puncture, unattended by hemorrhage or other evidence of danger, may in a short time prove the cause of the most serious and even fatal consequences.

In former times very indefinite ideas were entertained by medical men as to the symptoms of chest wounds, and their prognosis. Immediate coughing up of blood was regarded as pathognomonic of wound of the lung; John Bell declares of the instructed surgeon, that "if the patient spits blood, he fears a wound of the lung; if there be an emphysema, he is sure of it;" whereas, in fact, a wound of the lung may be accompanied by no hæmoptysis whatever, and emphysema very frequently exists without any pulmonary lesion. The following case will illustrate this point.

Daniel L.—, aged 45 years, was admitted into the Pennsylvania Hospital on the 8th of October, 1861, about quarter past nine o'clock in the evening, with incised wounds of the chest, and of the scalp. The scalp wound, which was between three and four inches long, was situated on the right side of the head, and bled most profusely, the posterior auricular artery of that side being fairly divided; the wound was dressed with gauze and collodion, and the hemorrhage arrested by a compress and firm bandage.

The wound of the chest was upon the left side, about an inch and a half below, and two and a half inches to the left of the nipple. The wound was about an inch and a quarter long, and apparently made by a sharp-pointed instrument.

There was a good deal of emphysema about the wound, spreading up the chest, and around to the back. The air was forcibly drawn in and blown out with a rushing noise at each respiration. There was some evidence of shock; the pulse 78 in the minute, but feeble, and the respiration twenty to the minute. There was much anxiety of breathing.

Here now were three symptoms well marked, any one of which is generally considered diagnostic of lung wound, viz., dyspnoea, emphysema, and tromatopnoea; and yet from the further history of this case it will, I think, appear that the lung was entirely unharmed.

The wound was closed by several points of lead suture, and a compress and bandage placed on it, and not removed until the sixth day. Two hours after admission the patient had reacted; the skin was warmer, and the pulse fuller; the breathing more easy. The respiration on the wounded side was somewhat feeble, but beyond this auscultation and percussion revealed nothing abnormal about his lungs.

Absolute diet and perfect rest were enjoined, and this constituted the treatment.

On the 14th, six days after his admission, the compress was removed, and the wound found healed through nearly all its extent, one or two drachms of pus being discharged from the upper angle. A lime-water dressing was now applied, and the diet changed for one more nutritious than had at first been permitted. No bad symptoms presented themselves, both the dyspnoea and the emphysema having spontaneously disappeared. On the 19th of October he was allowed to get up; the scalp wound was now entirely healed, and of the chest wound, but a point of ulceration remained. He was discharged, cured, on the 28th, the whole treatment having occupied but twenty days.

Now, in this case, the lung certainly could not have been wounded, or the recovery—if recovery had taken place—would have been more tardy. Here was a penetrating wound of the chest, with symptoms such as to cause the most serious apprehensions, and yet in the short space of eleven days the man was walking about, and to all intents perfectly well.

Gunshot wounds of the chest are generally more dangerous than stabs, as they are more likely to affect the deep-seated viscera, yet cases are on record where a ball has passed completely around, subcutaneously, without opening the thoracic cavity. Hennen met with two cases in which the ball passed between the costal pleura and the lung, making one-half the circuit of the chest, and yet not penetrating the lung; and, still more surprising, he mentions a case in which “the ball, which struck about the *Pomun Adami*, was found lying in the very orifice at which it had entered, having gone completely round the neck, and being prevented from passing out by the elasticity and toughness of the skin which confined it to this circular course.”

In the following case of gunshot wound of the lung, such a circular course was at first supposed, and a favourable result was accordingly hoped for; but the autopsy revealed that, in this instance, such a fortunate deflection had not occurred.

Mary A—, aged thirteen, was admitted into the women's surgical ward about seven o'clock in the evening of July 10th, 1861, with a gunshot wound of the chest. While sitting in the yard back of her father's house she was struck by a ball from a toy cannon, fired in the adjacent yard. There was found a compound comminuted fracture of the left clavicle about an inch and a half from its sternal end. The ball was found by the attending surgeon (who happened to be in the house at the time), posteriorly, lodged beneath the trapezius muscle, between the third and fourth ribs. It was immediately removed by a counter opening.

The symptoms of constitutional disturbance were so slight, and the general condition of the patient was so good, that it was supposed that the ball, after striking the clavicle, had been deflected in an upward direction, and, coursing along in a curved line, had found its place beneath the trapezius without wounding the lung. The case was attended by Dr. Goodman, and afterwards by Dr. Livezey, and I did not see it again, except casually.

Symptoms of pleuro-pneumonia showed themselves on the 19th, nine days after admission, and a fatal issue ensued on the morning of the 22d.

An *autopsy* was made six hours after death with the following results. There was a compound comminuted fracture of the left clavicle, with a spicula of bone penetrating the pleural cavity, and entering the apex of the lung, which was adherent at this point. The apex was in a state of congestion, hardly amounting to red hepatization, and, on making an incision, a clot was found in the lung, and the track of the ball well marked. The left pleural cavity was about half full of bloody serum, of which one and a half pints were removed. The lung was compressed against the vertebral column, and the heart pushed to the right side. Both pleural surfaces were covered with lymph. All the other organs which were examined appeared healthy.

In connection with wounds of the lung, I may refer to a case not strictly pertaining to this category, but of sufficient intrinsic interest to authorize my recording it in this place.

Richard F——, aged thirty, was admitted on the 23d of October, 1861, about nine in the morning, with an incised wound of the throat. While labouring under incipient mania-a-potu, the man had, with an ordinary table-knife, inflicted upon himself a most frightful gash. There were two wounds, one small and superficial on the right side of the throat, while the larger, which had an extent of fully five inches, was directly in front. The knife had completely divided the cricoid from the thyroid cartilage, going back to the anterior wall of the pharynx; the superior thyroid artery of the right side was divided, and bled freely; the sterno-cleido-mastoid muscles on either side were exposed, but neither the carotid arteries nor the jugular veins were injured.

The larynx above the cut was filled with clots, and clots and liquid blood mingled with mucus, were frequently coughed up from the trachea; the pulse was feeble, and the skin cold. A silver tube, such as used after the operation for tracheotomy, was introduced, a ligature placed upon the bleeding superior thyroid artery, and the wound closed by points of lead suture. As any effort at swallowing was followed by violent and frightful spasms of coughing, the patient was stimulated by heat to the feet, a sinapism to the abdomen, and enemata of brandy.

Between twelve and one o'clock he appeared moribund, his face covered with a cold sweat, and presenting all the evidences of approaching collapse. Under the treatment, however, he began to improve, and by three o'clock reaction was fully established, and he breathed easily through the tube. The expectoration of clots had also now ceased, and in a few hours more he was able to swallow without difficulty. Stimulation was now suspended, and arrowroot was directed to be given during the night, in quantities of a teaspoonful at a time.

No change was now perceived until about 11½ P. M., when he made an effort to rise in bed, which being prevented by the person in attendance, he was shortly after seized with dyspnoea, and died about ten minutes before midnight.

An *autopsy* was made seven hours after death, at which it was found that the larynx and trachea were perfectly healthy, but the bronchi filled with a frothy mucus, very slightly tinged with red; the lungs were healthy; the liver slightly enlarged and fatty. A microscopic examination

of a portion of the aorta made by my friend Dr. William F. Norris, revealed incipient fatty degeneration in this locality also.

This case affords an exception to the usual rule that wounds of the throat, not involving any large vessels, recover. Here the hemorrhage was entirely from small vessels, most of them so small that they could not be tied, and yet death resulted; not, however, from the hemorrhage, for the parts were found dry at the time of death, and there were no clots in the air-passages, but from the effusion, consequent upon the irritation, which the bleeding immediately following the injury produced.

One of the most frightful-looking wounds I have ever seen, and yet which proved perfectly innocuous, was a penetrating wound of the anterior mediastinal space.

The patient was admitted on the afternoon of Sept. 17th, 1861, with a large incised wound opening this cavity, and attended with considerable hemorrhage, probably from the mediastinal artery. The edges of the wound were brought together with lead wire, a large compress and firm bandage applied, and absolute diet and perfect rest enjoined. With the exception of a slight local pleurisy, not a bad symptom was presented; and the patient left the house well on the ninth day after the injury, the wound having united literally by the first intention.

Wounds of the heart were in old times considered inevitably and instantly fatal. Numerous recorded instances, however, have shown that life may be prolonged almost indefinitely, and that a recovery is far from impossible in wounds which at first appear very unpromising. Ambrose Paré knew that heart wounds were not always immediately fatal. Haller mentions a needle found in the heart of an ox. Fournier gives a case in which a ball was found in the right ventricle of the heart of a soldier, six years after he had received the wound. Chastenet knew a case in which the right ventricle was pierced by a bayonet, and yet life was maintained for fifteen days. Ferrus, quoted by Erichsen, mentions a case in which a man lived twenty days with a skewer traversing the heart from side to side. Nélaton saw a case in which a stab in the heart was not followed by death until the fourth day. Numerous other cases will be found referred to in the No. of this Journal for August, 1829, pp. 307-314.

The following case is of considerable interest, as adding another instance to what must be looked upon more as curiosities of surgical practice, than as furnishing much available instruction for therapeutical improvement.

Charles R—, coloured, was admitted to the North-house ward of the Pennsylvania Hospital on the evening of Friday, May 31, 1861, with an incised wound of the breast on the left side, which bled most profusely. It was dressed in the usual manner with a compress and bandage, the patient confined to bed and placed on an absolute diet. I first saw the case on the subsequent Monday, being the third of June, and the third day after the injury. At this time there was marked dyspnoea, and evidence of effusion into the pleural cavity. On the afternoon of the following day, the patient was much more comfortable. There was hardly any dyspnoea, and the inexperienced observer would certainly have prognosticated a more

favourable condition. At six o'clock the next morning the boy was dead. An autopsy was made nine hours subsequently with these results.

There was an incision on the left side of the breast, in a line with, and two inches below, the nipple. The sixth costal cartilage was divided, and the wound extended into the thorax, penetrating the pericardium and apex of the heart, and opening the left ventricle. There was also a small punctured wound in the base of the upper lobe of the left lung. The surface of the heart and the inner surface of the pericardium were extensively inflamed and thickened. There was also extensive pleurisy of the left side. The pleural cavity contained four and a half pints of bloody serum, and a small quantity of a similar fluid was obtained from the pericardial sac. Both lobes of the left lung were completely collapsed; the right lung was healthy.

From each of the five cases which I have recorded, may be derived some practical suggestions. From the first and fourth cases may be seen the advantage of not prematurely disturbing the original dressings; much harm is, I believe, done in this way. The young surgeon too often, under the delusion that he is manifesting a proper zeal, gratifies a hurtful curiosity to see how the wound looks, by continually renewing and disturbing the dressings, and thus does injury, and not benefit to his patient. In my first case it will be observed the wound, when once dressed, was not uncovered until the *sixth* day, and this I consider to have been the most important point in the treatment.

Another very important lesson which may be drawn from some of these cases, and especially from the last, is not to be deceived by the apparent amelioration of symptoms, which is but too often the immediate precursor of a fatal issue.

A cessation of dyspnœa, it must be remembered, may depend upon very different pathological conditions. It may be, and it is well for the patient when it is, from an absorption of effusion, and consequent disembarassment of the respiratory motions; but it may also arise from a total collapse of the lung, which then not admitting any air, of course the difficulty of breathing can exist no longer.

A favourable prognosis should, then, never be founded upon the cessation of dyspnœa alone; other symptoms must be taken into account, particularly the signs given by physical exploration of the chest. When these show that all is right within, then and then only are we justified in exciting new hopes in the minds of our patient and his friends. And generally in any wound of a cavity containing so many vital organs as the thorax, in view of the difficulty of diagnosing what is and what is not injured, the surgeon should be very careful in what he may say as to the prospects of the case. To be either too sanguine or too desponding, is a fault in the physician, and not unfrequently reacts most unfavourably on his patient.

In conclusion, the treatment in these cases should partake largely of the expectant character; and I think we owe much to Dr. Fraser for his excellent chapter on this subject. The barbarous mode of treatment by large

and continual bleedings may now be laid aside, and we shall no longer run the risk of what Marshall Hall quaintly calls "relieving the symptoms of reaction."

Quiet, rest, and low diet—these are the principal points to be attended to, when reaction (which should as much as possible be brought about by external stimulation) has fairly taken place. No routine treatment can be recommended beyond the hygienic measures above suggested; everything else must be adapted to the immediate exigencies of the occasion.

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ART. V.—*Brief Account of Dysentery as it occurred at Fort Jefferson, Tortugas, Florida.* By J. F. HAMMOND, M. D., Surgeon U. S. A.

*Dysentery*, as it occurs here, is simple, sthenic. It commences with loss of appetite, constipation, pains in the abdomen, and frequent calls to stool without passing anything. This is succeeded by diarrhœa, which is followed by frequent discharges of light-coloured viscid mucus, or blood, accompanied by severe tenesmus, some excitation of the pulse, anorexia, absence of thirst, and general suppression of the secretions.

*Heat* is an important element among the causes of this disease.

The experiments of Vierordt show that not only the number and depth of the respirations decrease with the increase of the temperature, and thus indirectly lessen the absolute quantity of carbonic acid given off by the lungs, but, also, that the percentage amount of it is diminished. From which it may be inferred that high temperature influences the excretion of carbonic acid by the lungs in some other way than by diminishing the mechanical functions of respiration. Numerous observers have shown that carbonic acid and nitrogen and certain peculiar volatile matters, the retention of which by suppression might give rise to various morbid conditions, are exhaled by the skin. Lehmann says that less of the gases is exhaled by the skin when the perspiration is active. And it is known that the formation of bile is suspended by the exhaustive influences of high atmospheric temperature.

Retention, in the blood, of deleterious secretions, may destroy the vitality of its fibrin. Whilst cytogenesis, the organic properties of simple membrane, the functions of the cells, and the metamorphosis and repair of the molecules of the tissues are impaired by an undue accumulation of carbonic acid, and the absence of oxygen.

No matter where dysentery may be thought to originate, there is no doubt that anatomical derangement of the fluids, or of the solids, will sooner or later be accompanied by disturbance in the nervous system. The